PIC – Next Generation (PIC – NG)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

September 2016

Rationale For Change

- PIC/IMS developed in 1999 – 2000
  - Developed on Windows NT, Windows XP was not released until October 2001
  - Requires developers with different skills than for PASS/NASS/EIV/VMS
- Accuracy of 50058 information
  - Approximately 1.3 million 50058 require resubmission each year
  - Significant time between data input and data validation
- Availability
  - 2016, 10 days below 80% availability, and PIC was only 96% available
- Integration with PHA applications
  - Custom/Different interfaces for 50058, inventory management
  - Difficult/Impossible to integrate PIC information into the PHA's application

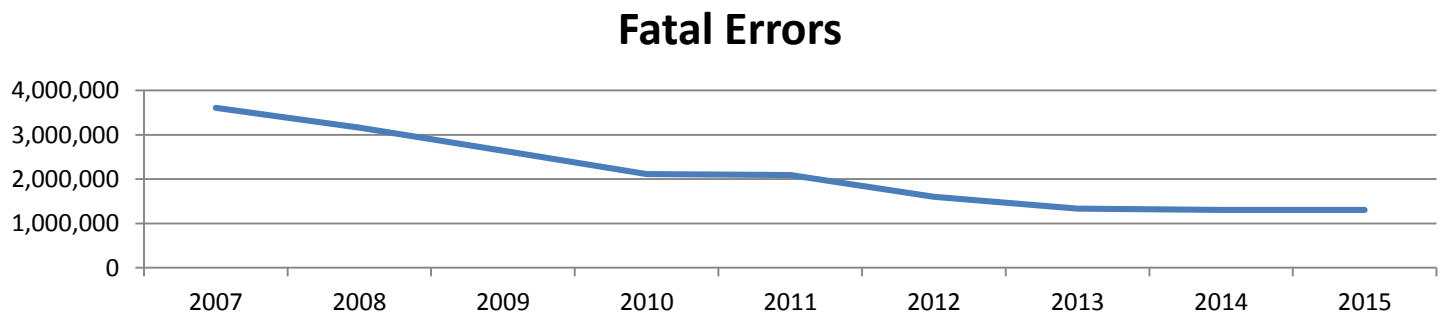
Vision

Create an enterprise ready G2B solution to :

- Improve the quality, availability, and delivery of information supporting HUD affordable housing programs
- Reduce administrative burden for PHA and HUD staff
- Provide HUD with an enterprise data collection solution for affordable housing information such as:
  - Section 8 and Low Rent Public Housing Tenant Information - 50058
  - New public housing developments
  - Demolition and Disposition of Public Housing properties
  - Inventory of Public Housing units and buildings
  - Operating Fund - 52722/23 (future)
  - Request for Tenancy Approval – 52517 (Future)
  - UPCS-V Physical Condition
  - Financial Statements, FDS

PHA Submissions to PIC/IMS

Year	Total 50058 Forms Submitted	Total Fatal Errors	Total Warnings	% 50058 Forms with Fatal Error	% 50058 Forms with Warnings
2007	10,417,014	3,606,616	1,048,866	35%	10%
2008	9,759,365	3,160,684	871,756	32%	9%
2009	9,514,043	2,638,590	549,381	28%	6%
2010	9,421,047	2,114,538	812,347	22%	9%
2011	9,306,925	2,094,005	796,742	22%	9%
2012	9,280,068	1,602,990	619,064	17%	7%
2013	8,929,610	1,336,168	559,469	15%	6%
2014	8,974,355	1,301,845	471,221	15%	5%
2015	8,766,618	1,305,453	458,401	15%	5%

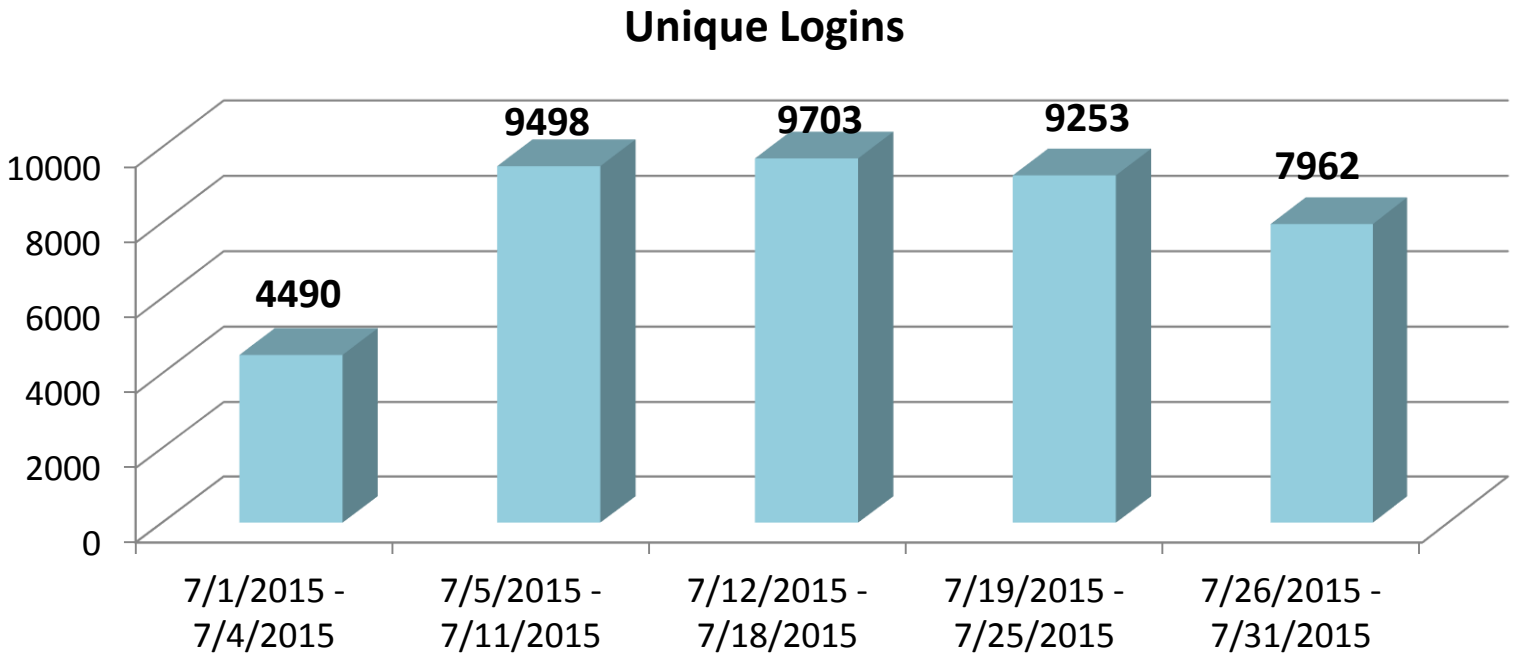


70% Section 8 – 30% Low Rent Public Housing

PHA's IT vendors efficiency has been a major factor in reducing fatal errors and warnings

Who Uses PIC and How Often

PIC Users	Number of Active User Accounts
HUD Users (Includes HUD staff, Contractors and Super Users)	4,250
PHA Users	44,200



PHA Issues with PIC/IMS

- PHAs interact with other parts of HUD and the US government
- Many PHAs use **multiple vendors** to run their properties, often due to mixed-finance
- Form 50058 error correction takes an average of 1 hr/error-costing approximately **1.3 million hrs/yr**
- Voiding records in PIC/IMS has a significant effect in the accounting portion of PHA software
- Not all tenants have a social security number
- Some **gaps exist** in the vendor software for PHA actions in PIC
- PHA applications may capture **information not transmitted** to PIC/IMS
  - Reasons for moving out
  - HUD form HUD-52517 Request for Tenancy Approval

HUD Issues with PIC/IMS

- PIC/IMS application developed in 1999-2000
  - Does not conform to Enterprise Architecture standards
  - Costly to maintain, requires different developer skill set
- No enhancements to PIC since 2007
  - 300+ outstanding enhancements requests
- Burdensome to PHAs to provide accurate information
  - No validation of information prior to submission
  - Contract with vendors to support PIC/VMS input often required
  - Batched data along with fatal errors creates heavy administrative burden
  - Enter VMS data manually, 30 days behind schedule, and is duplicate data
- No system design flexibility to accommodate change
  - Program Funding
  - Rental Assistance Demonstration

PIC-NG Approach

- **Stakeholder involvement**
  - More than 90% of PIC information comes from PHAs
- **Software development partnership between REAC and OCIO**
  - OCIO Infrastructure, Enterprise Architecture, and Information Security
  - REAC Federal software development team
  - Cloud application
  - Layered architecture to prevent vendor software lock in
- **Development methodology**
  - AGILE- Incremental software delivery with increasing functionality

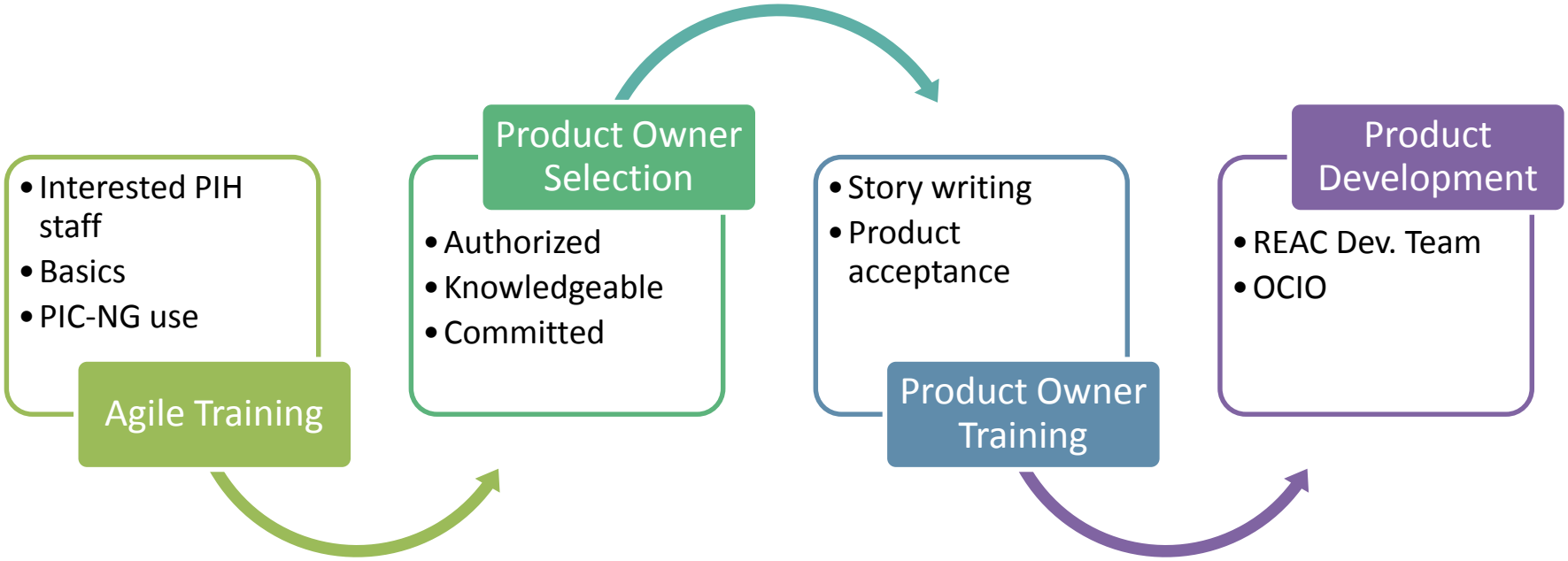
PIC-NG Progress

- **Outreach**
  - Working with PHAs and their software vendors to ensure feedback on Web Service and transition needs
  - Website for project status
- **Development Team**
  - 17 of the 21 REAC-IT programmers needed have been hired
  - Remaining developers being hired
- **The Cloud and Infrastructure**
  - OCIO have provided REAC-IT with a cloud-based environment
  - REAC-IT and Enterprise Architecture team deploying and configuring the standard software platform

How is Agile Different

Traditional- Waterfall	New and Improved- Agile
Extensive documentation of all foreseen requirements required before, during and after development	Minimal necessary documentation to create chunks of working software every 2 weeks
One-time business involvement to establish all requirements	Constant business involvement in requirements
Black-box development: Business does not see product until testing phase	Business sees incremental product development at the end of every sprint an provides feedback
Led by GTM, GTR	Led by product owner and stake holders
Changes made after testing (if allowed)	Changes can be made after every sprint

Business Users Drive PIC-NG Outcome



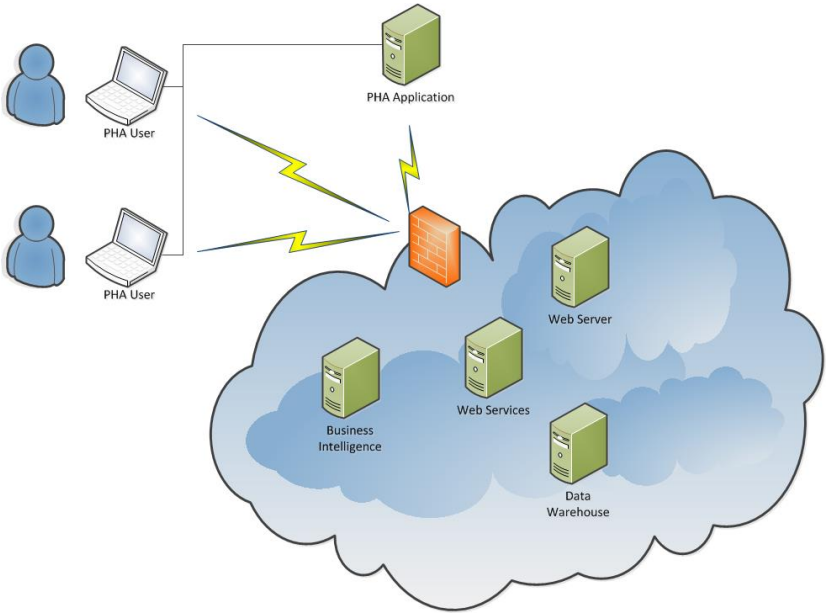
HUD and PHA Stakeholders are engaged throughout the development process to ensure that the end result meets current and future needs

PIC-NG Solution

- Creates a common approach for PHAs submission of HUD required information
- No upload denial (no fatal edits) – Dramatically decreases PHA administrative burden
- Simplified user access, removes need to align PHA application security with PIC-NG application security
- PHA users work in their own systems and information is streamed to HUD
- Ease of data correction, removes PHA accounting issues
- PHA staff can focus on the mission of assisting tenants rather than trying to provide information to HUD
- PHAs are the single data source for tenant and physical inventory information

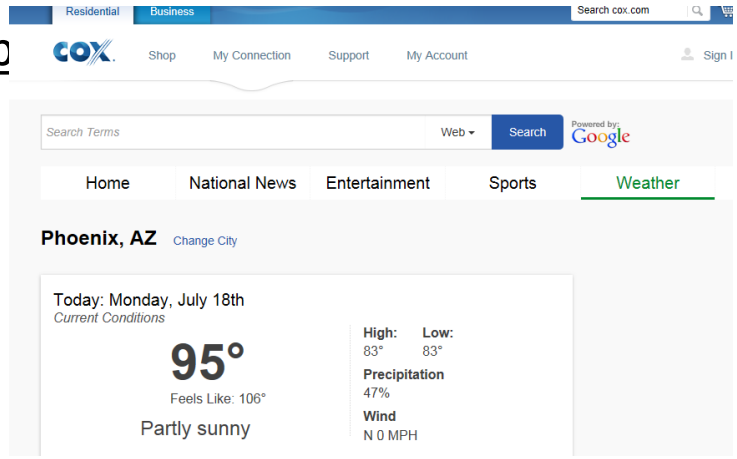
PIC/IMS Current Data Submission

- Centralized application - all users have the same interface
- Difficult to integrated with PHAs existing applications
- Requires software vendors to develop custom interfaces

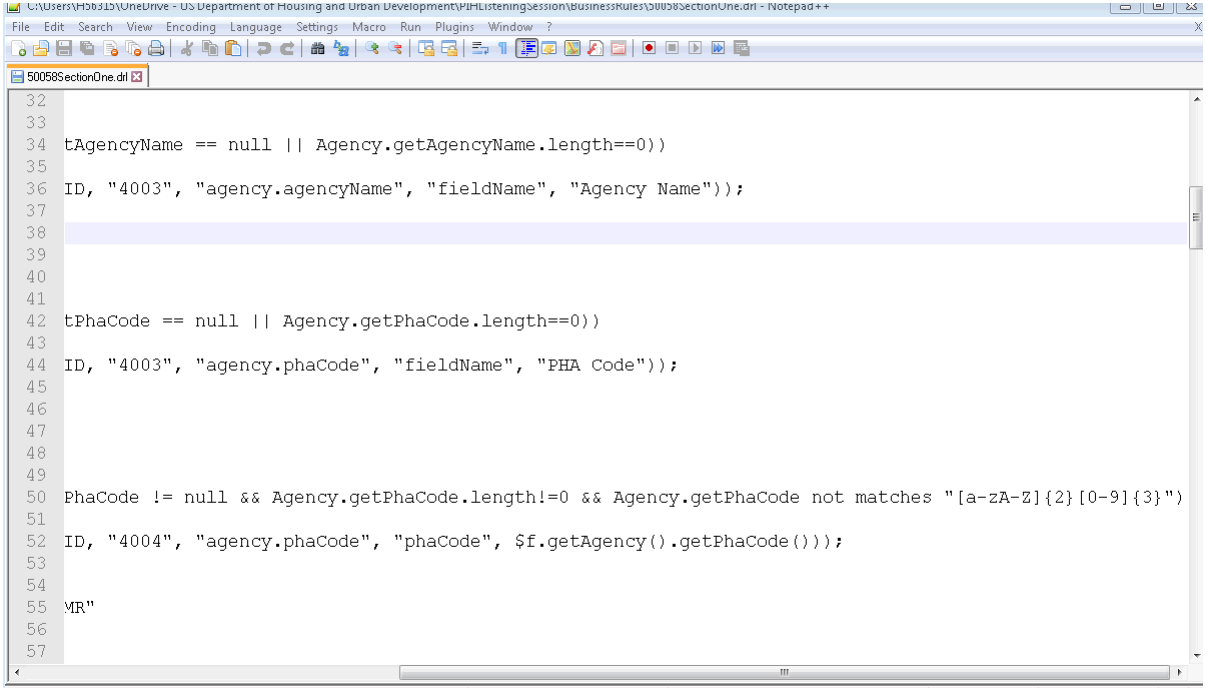


PIC-NG Proposed Data Submission

- Share Business Rules with PHAs
- Integration with PHA vendor applications allow distributed applications
- Each PHA vendor software can have different interfaces based on their users specific role and needs
- Industry standard interfaces
  - Weather: http://openweathermap.org/API
  - Twitter: https://dev.twitter.com/rest/p



PIC-NG Business Rules



NAME:	PHA Code
DESCRIPTION:	Unique code assigned to the PHA by HUD
TYPE:	Alphanumeric
SIZE:	5
COMMENTS:	Use postal state codes (exception for Islands) and Number HUD uses to recognize the PHA in that state. For Section 8, this PHA number must have active units.

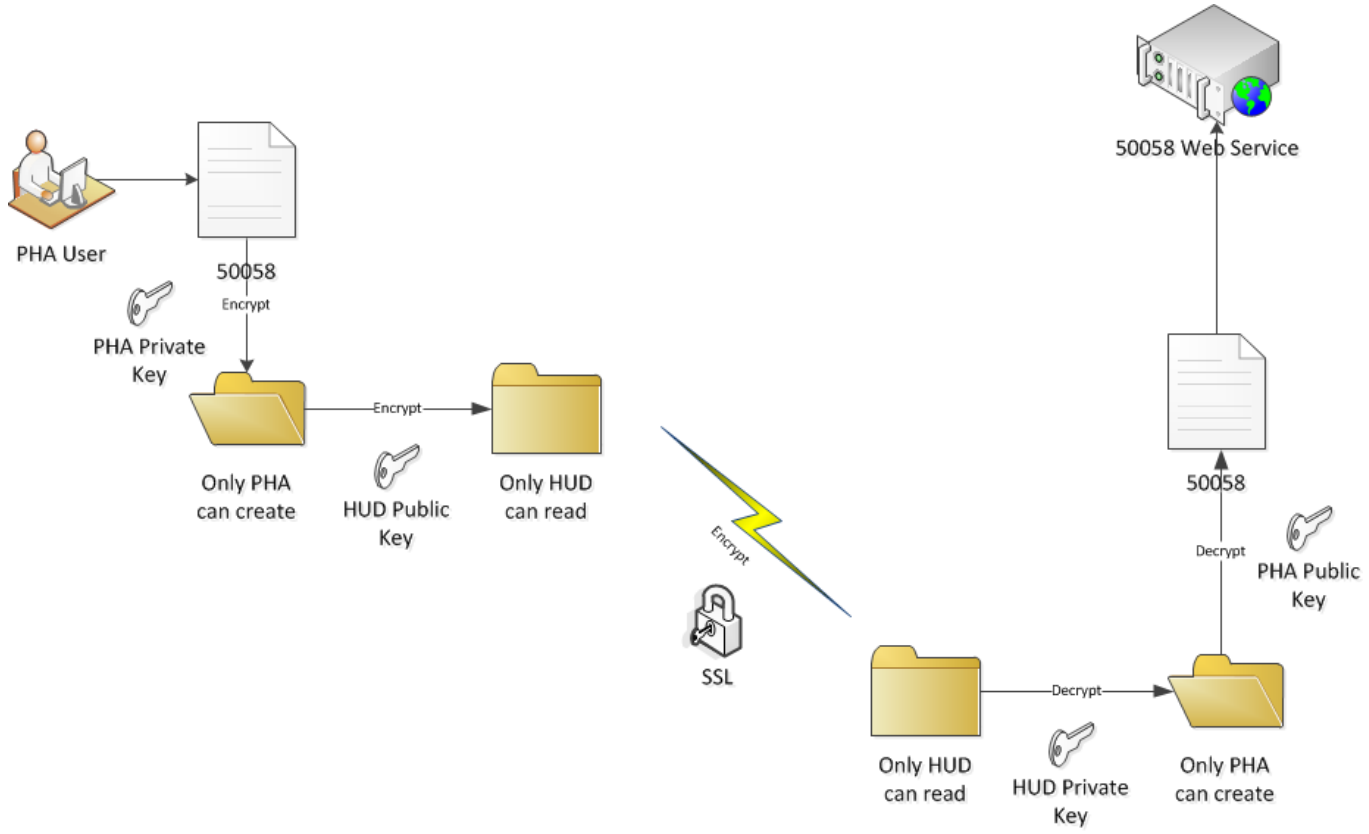
EDITS:

- Fatal: • Must be a valid 5 character PHA code that exists in PIC
- Fatal: • Must equal Owner/PHA Mailbox ID in the Header Record, or must equal a valid PHA code for which the PHA or vendor specified by Owner/PHA Mailbox in the Header Record is authorized by HUD to submit data
- Fatal: • Must equal a valid PHA code in PIC
- Fatal: • If 1c equals 'CE' or 'VO', must be the PHA code for a PHA that has active units

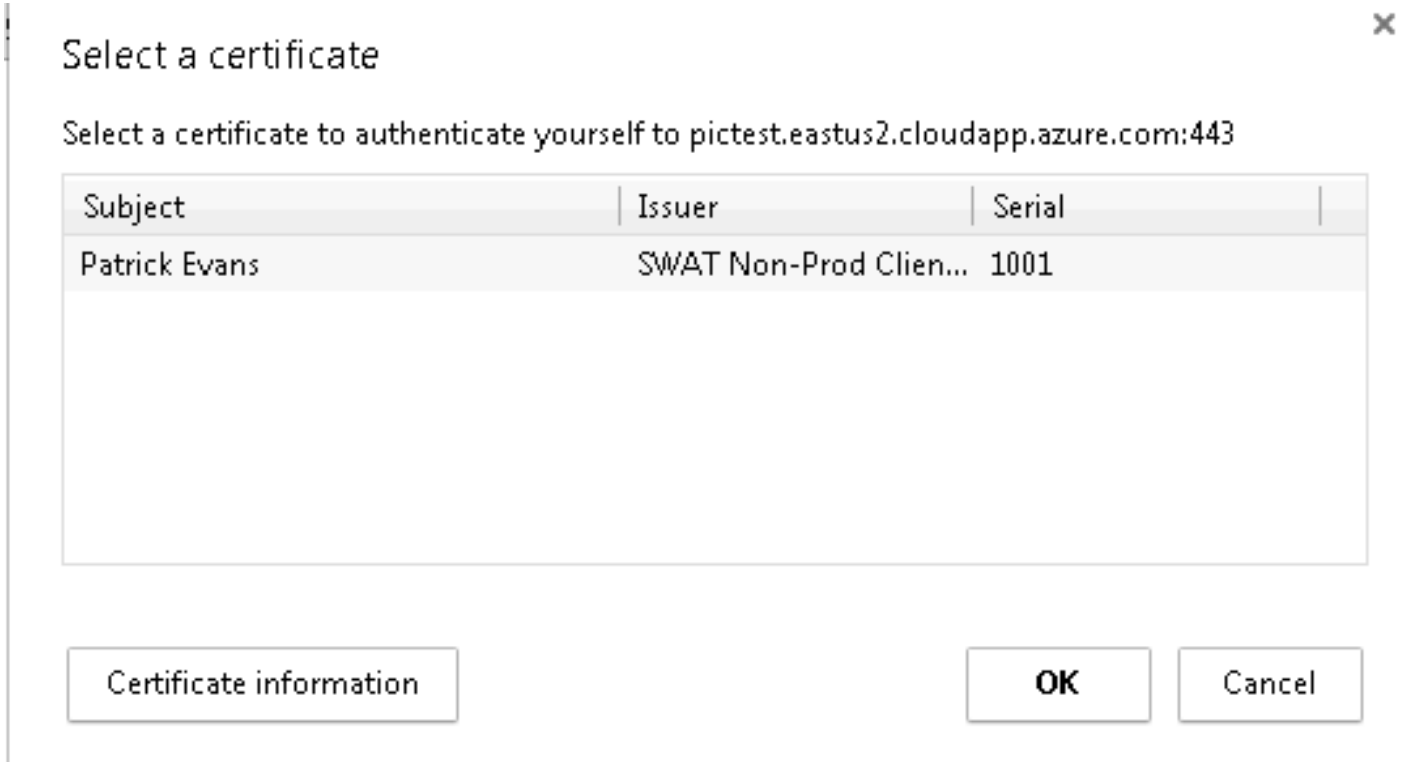
Share Drools rules to eliminate any ambiguity in Technical Reference Guide

Security

PHA can use Digital Certificates rather than userid/password



Security

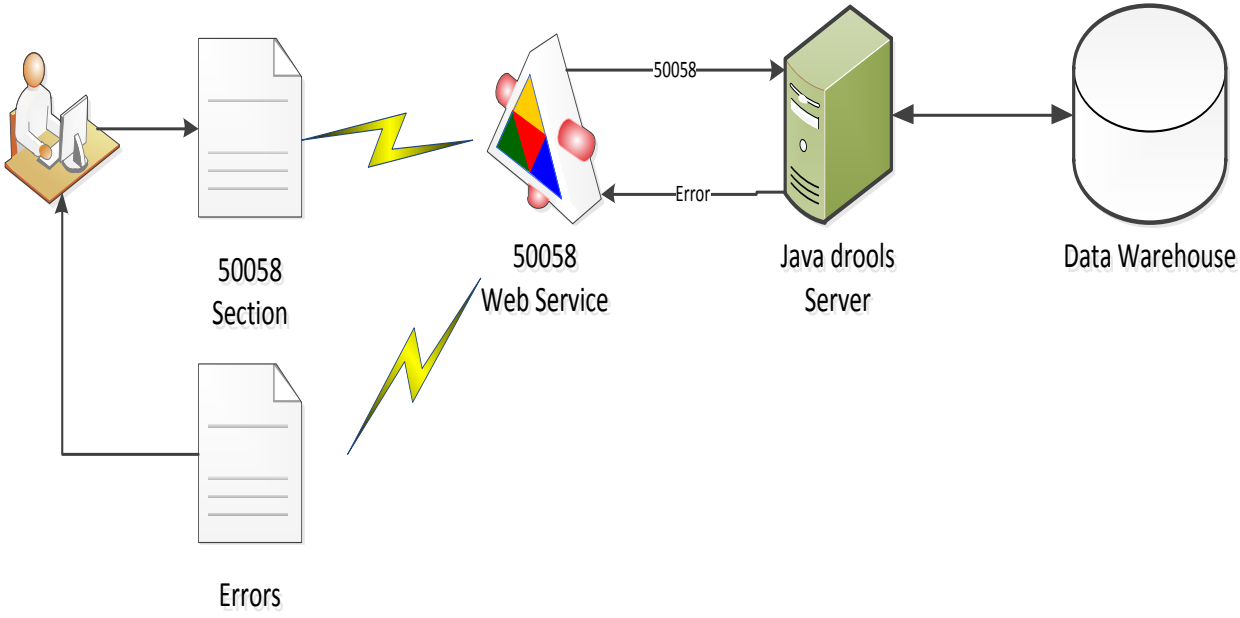


https://pictest.eastus2.cloudapp.azure.com/pic_ng_web/#/home

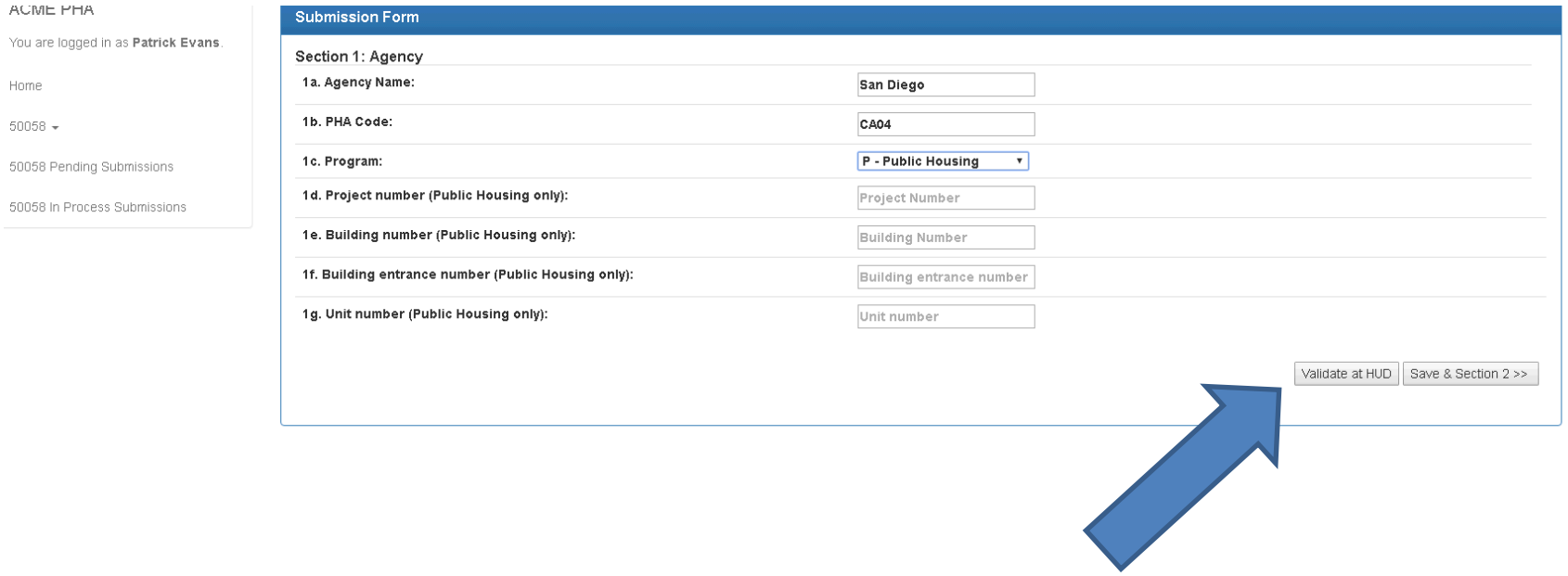
Synchronous

Information validation

- Synchronous, vendor application can call PIC-NG to validate each section/portion of the 50058 and return any errors
- Information returned can be used in the PHAs application
- Significantly reduces the time between data input and data validation



Synchronous

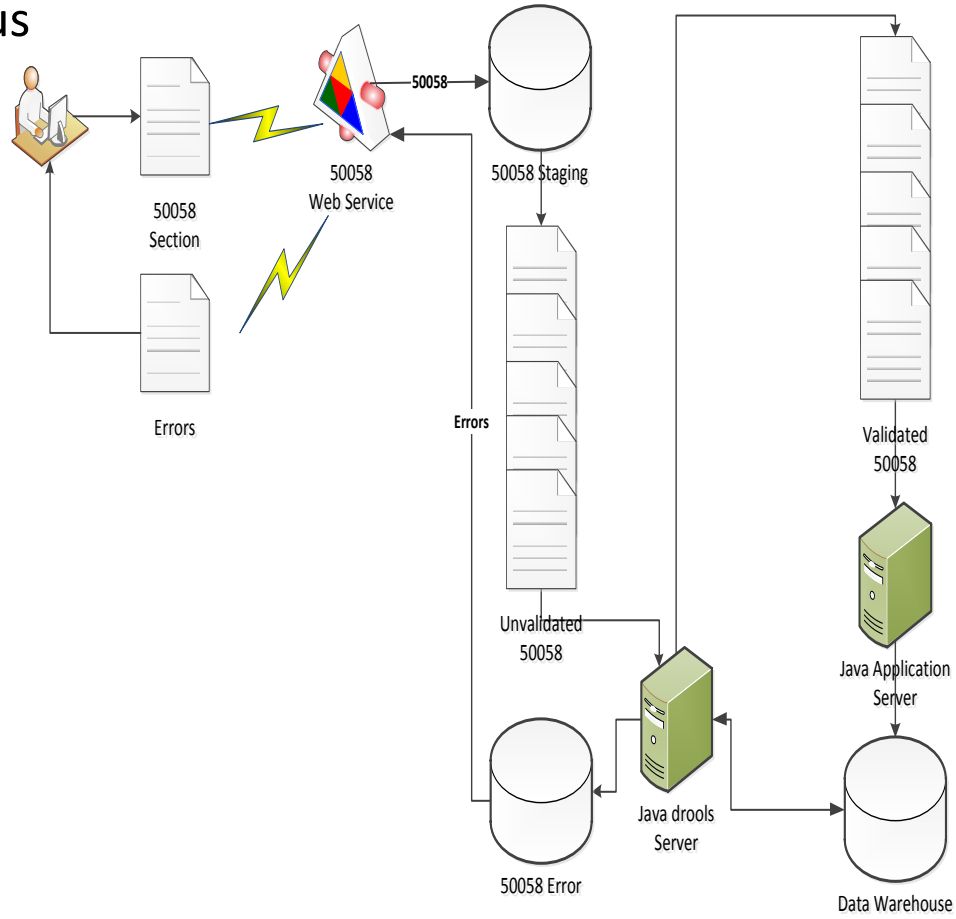


Synchronous

Asynchronous

Completed information submitted to HUD

- Asynchronous – submit to a queue and back ground processes later
- Services to show the status of a submission



Asynchronous

50058 In Process Submissions

ID	Creation Date	Submission ID	Submission Date	Action
32	2016-08-26	262	2016-08-26	Hide

Last Action	Processed On
HUD-50058 Family Report - Processing CLOB	Aug 26, 2016 7:30:44 AM

30	2016-08-23	224	2016-08-23	Hide

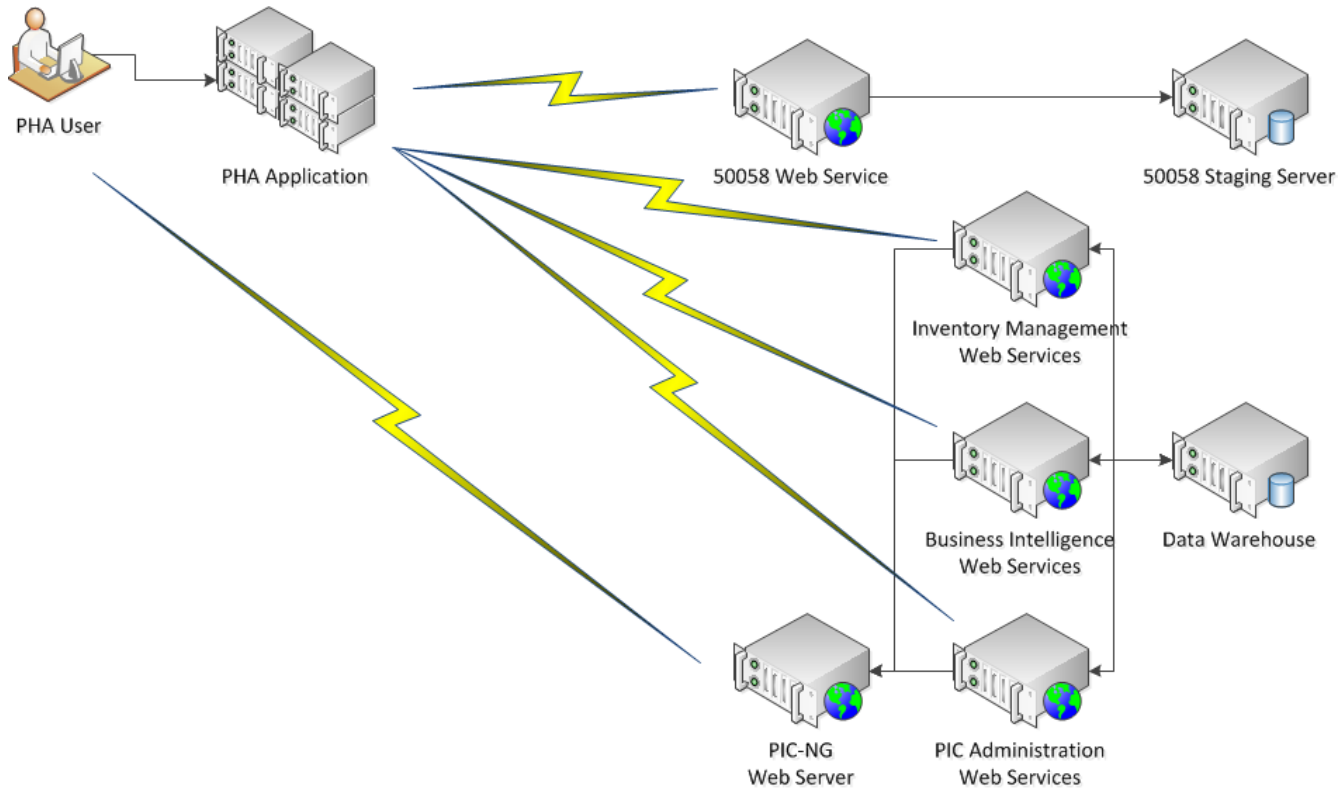
Last Action	Processed On
HUD-50058 Family Report - Completed Processing CLOB	Aug 23, 2016 1:51:36 PM

Errors	
4054	Action Type 65 must be numeric (1-15)
4004	PHA Code CAOO4 is invalid, inactive, or not in the database
4016	Project number must be filled in when Program is Public Housing
4082	Effective Date 02302015 must be in date format: MMDDYYYY
4026	Building number must be filled in when Program is Public Housing
4094	Admission date musst be in date format: MMDDYYYY
4034	Building entrance number must be filled in when Program is Public Housing
4038	Unit number must be filled in when Program is Public Housing

26	2016-08-22	193	2016-08-22	View
12	2016-08-19	100	2016-08-19	View

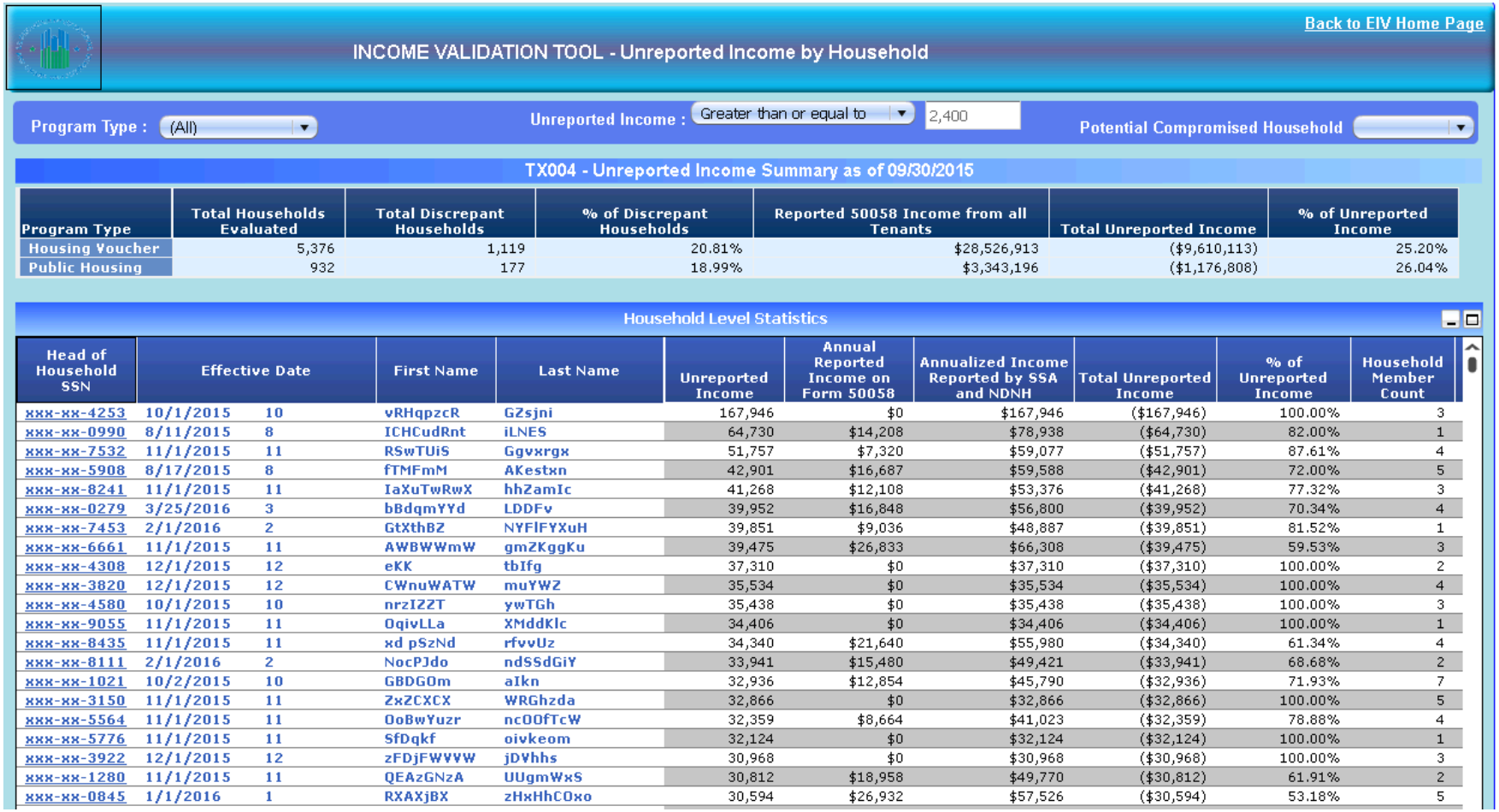
PIC-NG Common Data Exchange

- PIC-NG web application developed using Web Services
  - Web Services can be used by PHA vendor applications
  - Vendor applications can integrate seamlessly



DEMONSTRATION

Business Intelligence



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INCOME VALIDATION TOOL - Unreported Income by Household

Program Type : (All) Unreported Income : Greater than or equal to 2,400 Potential Compromised Household

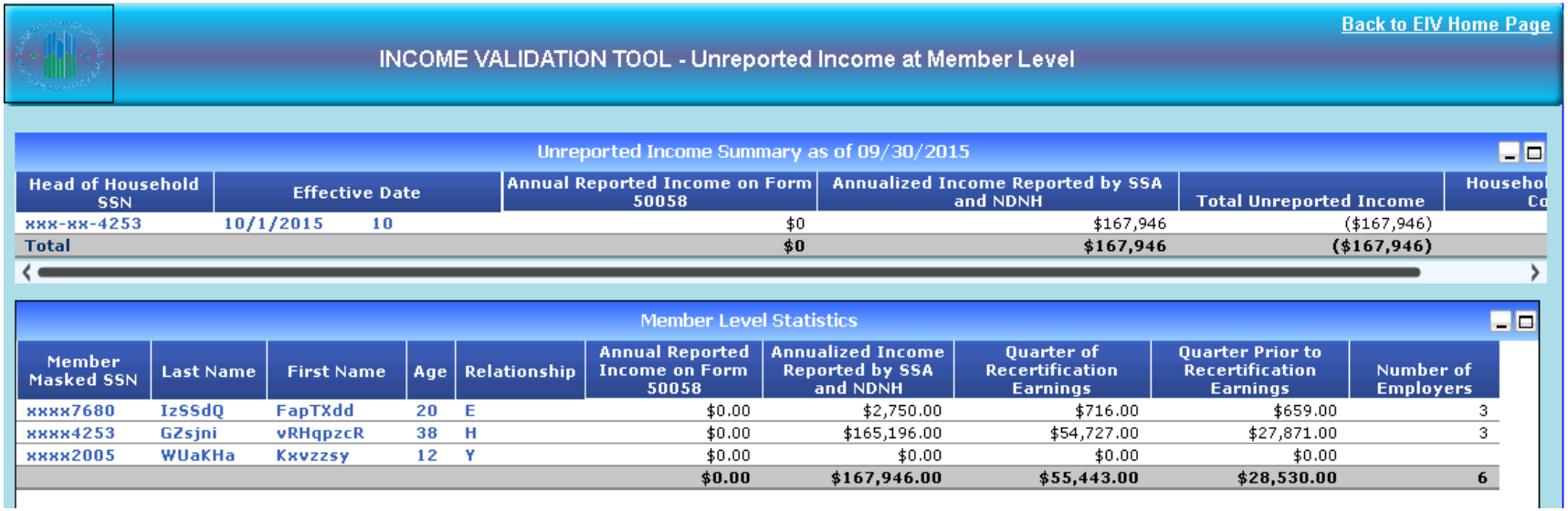
TX004 - Unreported Income Summary as of 09/30/2015

Program Type	Total Households Evaluated	Total Discrepant Households	% of Discrepant Households	Reported 50058 Income from all Tenants	Total Unreported Income	% of Unreported Income
Housing Voucher	5,376	1,119	20.81%	$28,526,913	($9,610,113)	25.20%
Public Housing	932	177	18.99%	$3,343,196	($1,176,808)	26.04%

Household Level Statistics

Head of Household SSN	Effective Date		First Name	Last Name	Unreported Income	Annual Reported Income on Form 50058	Annualized Income Reported by SSA and NDNH	Total Unreported Income	% of Unreported Income	Household Member Count
xxx-xx-4253	10/1/2015	10	vRHqpzcR	GZsjni	167,946	$0	$167,946	($167,946)	100.00%	3
xxx-xx-0990	8/11/2015	8	ICHCudRnt	iLNES	64,730	$14,208	$78,938	($64,730)	82.00%	1
xxx-xx-7532	11/1/2015	11	RSwTUiS	Ggvxrgx	51,757	$7,320	$59,077	($51,757)	87.61%	4
xxx-xx-5908	8/17/2015	8	fTMFmM	AKestxn	42,901	$16,687	$59,588	($42,901)	72.00%	5
xxx-xx-8241	11/1/2015	11	IaXuTwRwX	hhZamIc	41,268	$12,108	$53,376	($41,268)	77.32%	3
xxx-xx-0279	3/25/2016	3	bBdqmYYd	LDDFv	39,952	$16,848	$56,800	($39,952)	70.34%	4
xxx-xx-7453	2/1/2016	2	GtXthBZ	NYFlFYXuH	39,851	$9,036	$48,887	($39,851)	81.52%	1
xxx-xx-6661	11/1/2015	11	AWBWWmW	gmZKggKu	39,475	$26,833	$66,308	($39,475)	59.53%	3
xxx-xx-4308	12/1/2015	12	eKK	tbIfg	37,310	$0	$37,310	($37,310)	100.00%	2
xxx-xx-3820	12/1/2015	12	CWnuWATW	muYWZ	35,534	$0	$35,534	($35,534)	100.00%	4
xxx-xx-4580	10/1/2015	10	nrzIZZT	ywTGh	35,438	$0	$35,438	($35,438)	100.00%	3
xxx-xx-9055	11/1/2015	11	OqivLLa	XMddKlc	34,406	$0	$34,406	($34,406)	100.00%	1
xxx-xx-8435	11/1/2015	11	xd pSzNd	rfvvUz	34,340	$21,640	$55,980	($34,340)	61.34%	4
xxx-xx-8111	2/1/2016	2	NocPJdo	ndSSdGiY	33,941	$15,480	$49,421	($33,941)	68.68%	2
xxx-xx-1021	10/2/2015	10	GBDGOm	aIkn	32,936	$12,854	$45,790	($32,936)	71.93%	7
xxx-xx-3150	11/1/2015	11	ZxZCXCX	WRGhzda	32,866	$0	$32,866	($32,866)	100.00%	5
xxx-xx-5564	11/1/2015	11	OoBwYuzr	ncOOfTcW	32,359	$8,664	$41,023	($32,359)	78.88%	4
xxx-xx-5776	11/1/2015	11	SfDqkf	oivkeom	32,124	$0	$32,124	($32,124)	100.00%	1
xxx-xx-3922	12/1/2015	12	zFDjFWVVW	jDVhhs	30,968	$0	$30,968	($30,968)	100.00%	3
xxx-xx-1280	11/1/2015	11	QEAzGNzA	UUgmWxS	30,812	$18,958	$49,770	($30,812)	61.91%	2
xxx-xx-0845	1/1/2016	1	RXAXjBX	zHxHhCOxo	30,594	$26,932	$57,526	($30,594)	53.18%	5

Business Intelligence



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INCOME VALIDATION TOOL - Unreported Income at Member Level

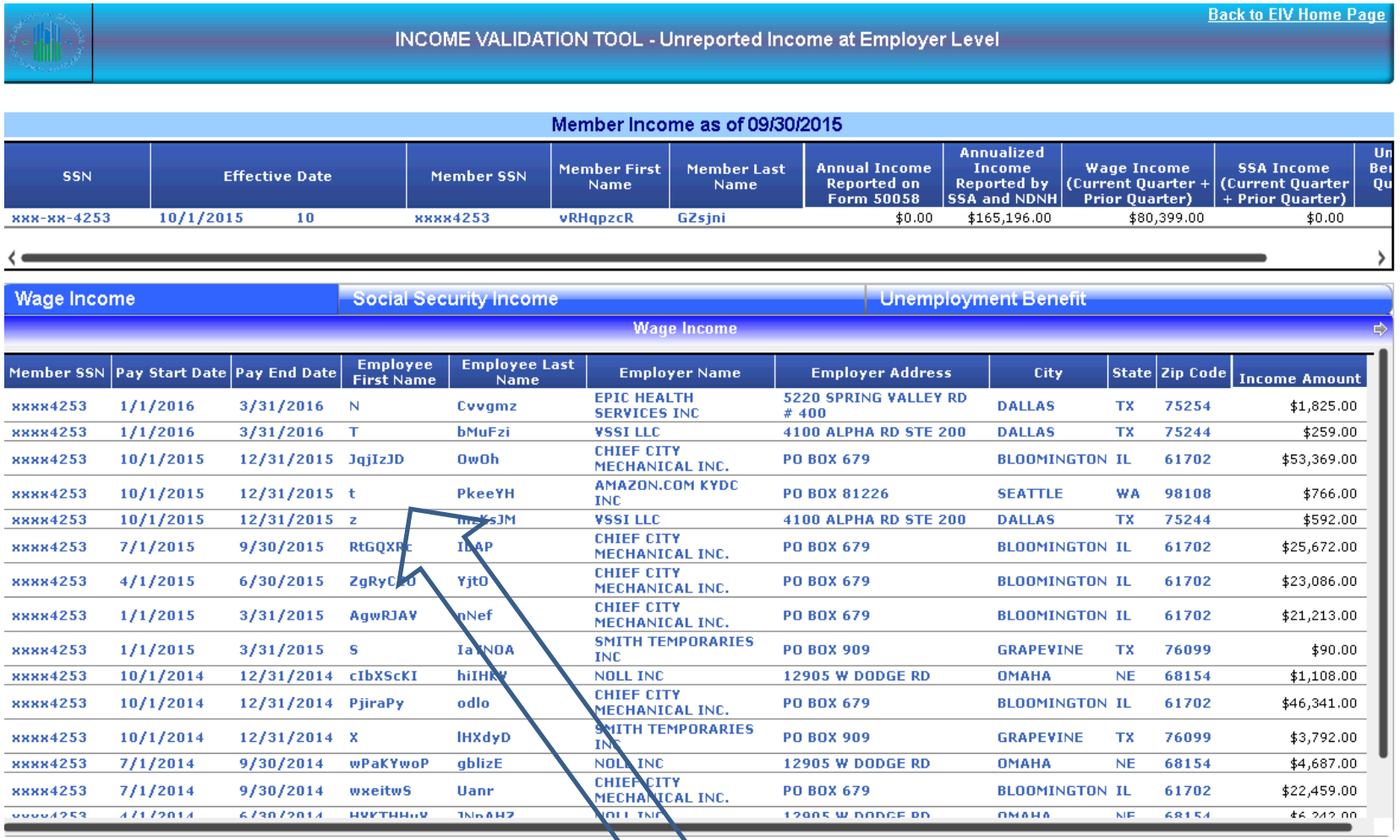
Unreported Income Summary as of 09/30/2015

Head of Household SSN	Effective Date		Annual Reported Income on Form 50058	Annualized Income Reported by SSA and NDNH	Total Unreported Income	Household Co
xxx-xx-4253	10/1/2015	10	$0	$167,946	($167,946)	
Total			**$0**	**$167,946**	**($167,946)**	

Member Level Statistics

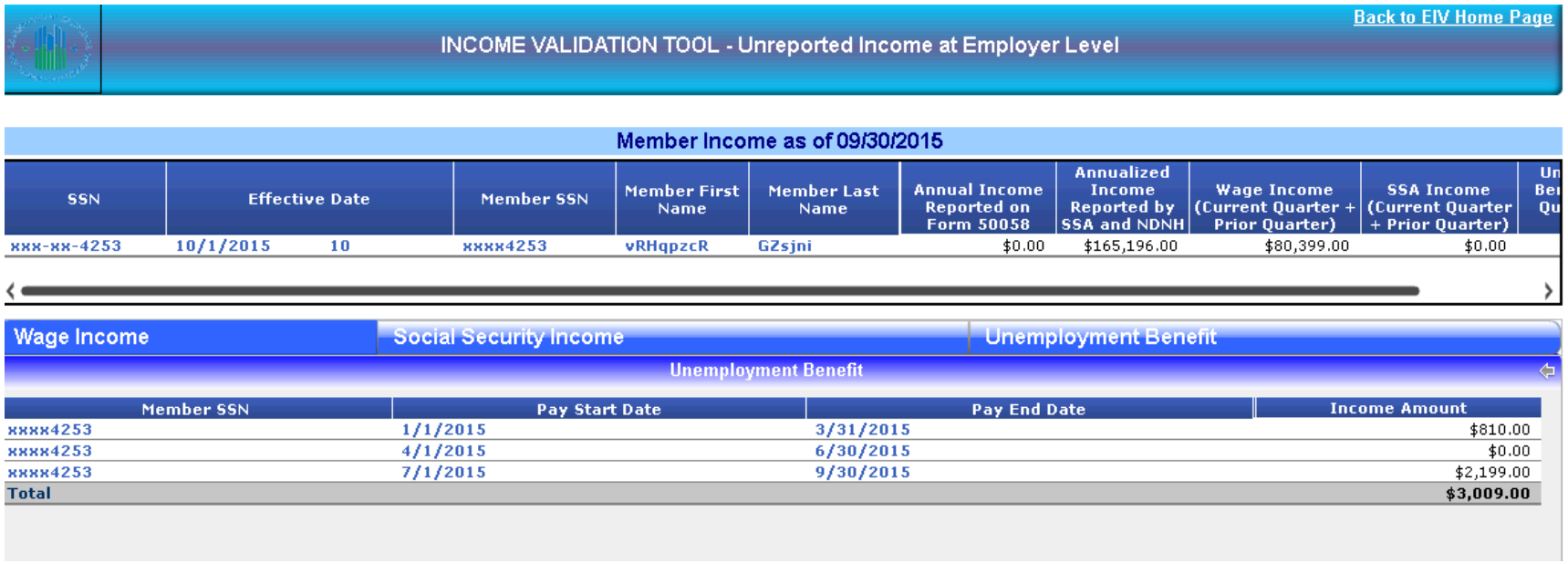
Member Masked SSN	Last Name	First Name	Age	Relationship	Annual Reported Income on Form 50058	Annualized Income Reported by SSA and NDNH	Quarter of Recertification Earnings	Quarter Prior to Recertification Earnings	Number of Employers
xxxx7680	IzSSdQ	FapTXdd	20	E	$0.00	$2,750.00	$716.00	$659.00	3
xxxx4253	GZsjni	vRHqpzcR	38	H	$0.00	$165,196.00	$54,727.00	$27,871.00	3
xxxx2005	WUaKHa	Kxvzzsy	12	Y	$0.00	$0.00	$0.00	$0.00	
					$0.00	**$167,946.00**	**$55,443.00**	**$28,530.00**	**6**

Business Intelligence



Possible Identity Theft?

Business Intelligence



PIC-NG Roadmap

	Current State	June 2016	December 2016	March 2017	June 2017	September 2017
Business Functionality		• **PHA Pilot** • 50058 streaming • Business to Government Security	• **ONAP VASH** • 50058 file • 50058 validation • Tenant Reporting • PII Minimization	• **Section 8 Only PHAs** • 50058 streaming • 50058 file • 50058 pre validation • 50058 validation • Tenant Reporting • PII Minimization • SEMAP	• **Section 8 Only and Combined PHAs** • 50058 streaming • 50058 file • 50058 pre validation • 50058 validation • Tenant Reporting • PII Minimization • SEMAP	• **All PHAs** • 50058 streaming • 50058 file • 50058 validation • 50058 pre validation • Tenant Reporting • PII Minimization • SEMAP • Low Rent Inventory • Demolition Disposition

EIV Validation

EIV Validation

EIV Tenant Validation

000001001

Validate EIV Tenant

Tenant Information	
Name (First, M, Last)	LLXZCZAIPL P. IAWGSEVPNW
Program Type	P
PHA Code	SK859
Project Number	SK85922605
Building Number	60448
Building Entrance Number	914
Unit Number	35213
Address Line 1	459 YSUQIBREYU
Address Line 2	APT NO 746
City	BOQZIFNVRE
Zipcode	69137

Stakeholder Engagement

Industry conferences and engagement
Industry Day - April 2015
Emphasys Conference - August 2015
OATHA Conference - October 2015
Yardi Conference - October 2015
Ten Mast Conference - October 2015
Industry Demonstration - March 2016
Yardi Conference - June 2016
NAHRO Conference - July 2016
Emphasys Conference - August 2016
NAHRO Conference - October 2016

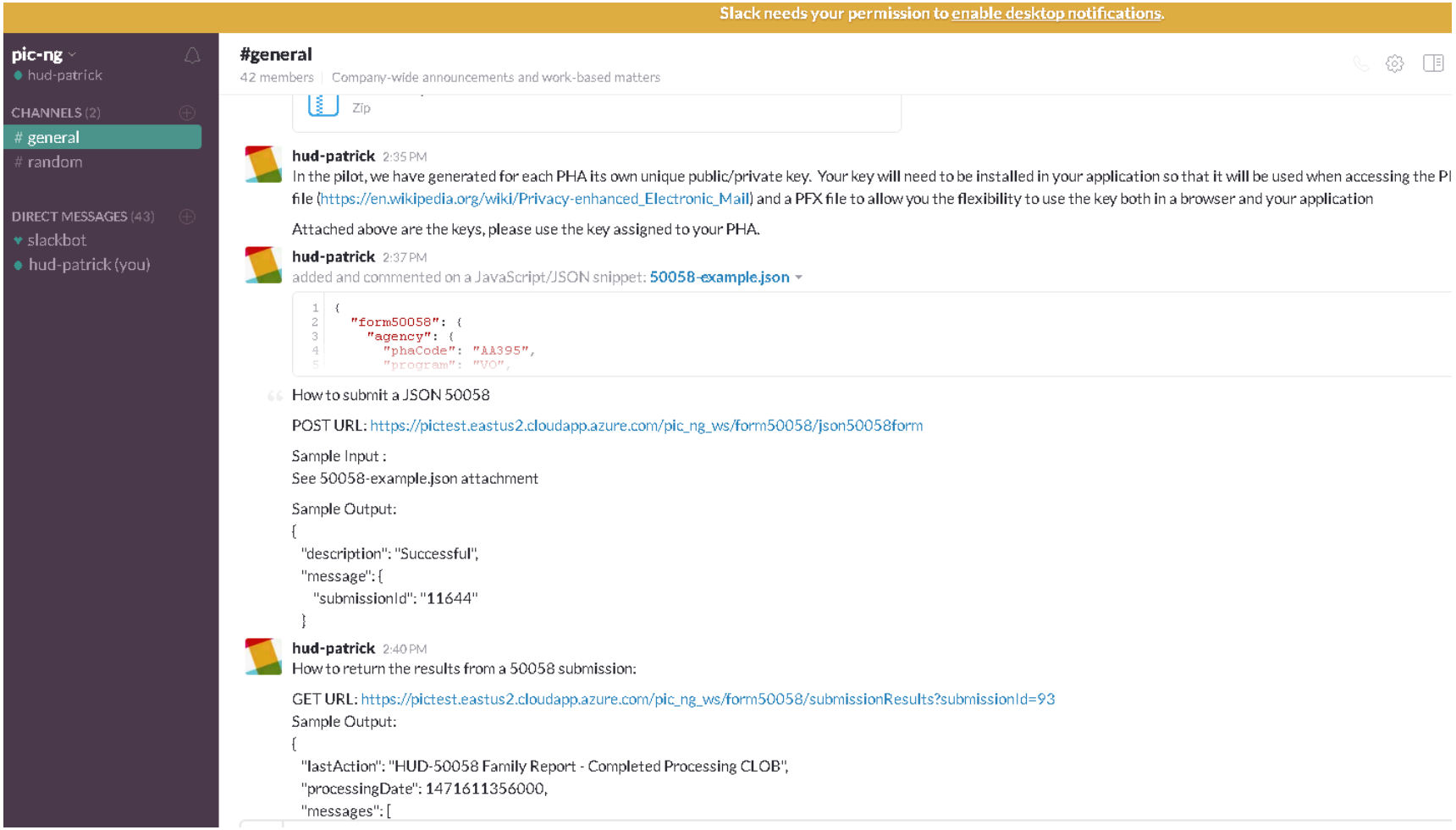
PHA engagement
New York City Housing Authority, August 2015 Lincoln PHA – September 2015
Saint Paul PHA - November 2015
Boston PHA - December 2015
PHA Pilot- Summer 2016
PHA Listening Sessions - June-September 2016

Consistent, proactive engagement with PHAs and industry partners to create a more flexible, effective product

PIC-NG Next Steps

- Proof Of Concept – PHA Data Exchange – Web Services/Security
  - Yolo Housing Authority, CA
  - St. Paul Housing Authority, MN
  - Hagerstown Housing Authority, MD
  - Contra Costa Housing Authority, CA
  - New York City Housing Authority, NY
  - Tulsa Housing Authority, OK
  - Boston Housing Authority, MA
  - Michigan State Housing Development Authority
  - First phase: Test transmittal of 50058 Section 1,2 and 4 using a secure and encrypted web service
  - Second phase: Parallel transmittal of the full 50058 using the web services and submitting the 50058 in PIC to test for
    - No loss of records
    - Data transmitted without corruption
    - Error messaging works and is user friendly
    - Metric to measure time saved using the Web Service

PIC-NG Next Steps



https://pic-ng.slack.com/messages/general/

What does the future hold?

- After the tenant information is conquered, we then will turn to the rest of PIC-NG
  - SEMAP submittals
  - Building and unit changes
  - Removals form inventory
  - Reports and Business intelligence

- We will need to work closely with you to determine the best solution since some of these features may not be fully part of your current PHA software packages

PIC-NG

Questions?